

SLIVER FEEDING MEANS FOR HIGH PILE FABRIC CIRCULAR KNITTING MACHINES

CROSS-REFERENCE TO OTHER APPLICATIONS

This application is a division of my pending patent application Ser. No. 304,099 filed Nov. 6, 1972, entitled "Sliver Feeding Means for High Pile Fabric Circular Knitting Machines".

SUMMARY OF THE INVENTION

The primary object of this invention is to provide new and improved sliver feeding means for multi-feed high pile fabric circular knitting machines having pattern means whereby each sliver feeding device of the machine is individually and accurately controlled, according to a predetermined fabric pattern.

A further object of the invention is to provide a sliver feeding means for high pile fabric circular knitting machines having control means for feeding sliver selectively intermittently to the needles, according to a predetermined pattern, while avoiding build up of sliver fibers on the doffer.

A further object of the invention is to provide a sliver feeding means having sliver feed roll control means for varying the rate of sliver feed, to vary selectively the density of the sliver in the fabric. By means of such speed control means, the same weight of sliver can be utilized for several different weights of fabric, by varying selectively the rate of sliver feed to the needles of the knitting machine.

A further object of the invention is to provide a sliver feeding means for high pile fabric circular knitting machines having shredding means for shredding or tearing the sliver, and forming it into a uniform sheet of fibers for presentation to the needles of the knitting machine thereby eliminating slugs, ribs and similar defects in the fabric.

To achieve the foregoing objectives, the invention, in its preferred form, comprises the usual wire-covered doffer and main cylinder, a pair of wire-covered feed rolls for delivering sliver to the main cylinder, the wire coverings of the feed rolls meshing with each other and with the wire covering of the main cylinder, pattern mechanism controlling an electric clutch for imparting intermittent rotation to the feed rolls, according to any selected pattern, and adjustable speed control means for varying selectively the rate of rotation of the feed rolls, and hence the rate of sliver feed to the knitting machine. By means of the foregoing arrangement, it is possible, for the first time, to knit multi-color pile fabric patterns of random design, free of rigid or stripped effects, having a predetermined pile density, utilizing sliver of constant, pre-selected weight.

DESCRIPTION OF THE VIEWS OF THE DRAWING

FIG. 1 is a partial view in top plan showing the knitting head of a multi-feed high pile fabric circular knitting machine equipped with a plurality of sliver feeding means incorporating this invention.

FIG. 2 is an enlarged, fragmentary view in side elevation indicated by the arrows 2—2 of FIG. 1, showing a preferred sliver feeding means of this invention.

FIG. 3 is an enlarged, fragmentary, sectional view in side elevation of the sliver feeding means, indicated by the arrows 3—3 of FIG. 1.

FIG. 4 is an enlarged, fragmentary view in section indicated by the arrows 4—4 of FIG. 3.

FIG. 5 is an enlarged, fragmentary view in front elevation indicated by the arrows 5—5 of FIG. 3.

FIG. 6 is an enlarged, fragmentary view in section showing the meshing of the feed rolls and main cylinder of the sliver feeding means, taken from within the broken rectangle indicated at 6 in FIG. 3.

FIG. 7 is an enlarged, fragmentary view in top plan of the sliver selection means illustrated within the broken circle 7 of FIG. 1.

FIG. 8 is an enlarged, fragmentary, sectional view in elevation indicated by the arrows 8—8 of FIG. 7.

FIG. 9 is an enlarged, fragmentary view in elevation of one of the jacks used in the sliver selection means of FIG. 7.

FIG. 10 is a fragmentary, schematic illustration of the type of random-design, multi-color, high pile fabric produced by a knitting machine employing the sliver feeding means of this invention.

DETAILED DESCRIPTION OF THE INVENTION

In FIG. 1, by way of illustration, there is shown in top plan the knitting head of an eight feed high pile fabric circular knitting machine. The machine is provided with eight sliver and yarn feeding stations spaced uniformly about the circle of needles 20. For convenience, the eight sliver and yarn feeding stations have been designated, proceeding in the direction of needle rotation, by the reference numerals 1 to 8 inclusive. Also uniformly spaced about the circle of needles 20 are eight pattern mechanisms 11 to 18 inclusive, each including conventional needle selecting pattern drums. Each of the mechanisms 11-18 is disposed angularly in advance of one of the feeding stations 1-8, and selects needles in accordance with standard knitting practice. Thus, the needle selection means of mechanism 11 selects those needles which are to receive sliver at station 1, the needle selection means of mechanism 12 selects those needles which are to receive sliver at station 2, etc.

Each of the sliver and yarn feeding stations of the machine includes the usual yarn feeding means (not shown) together with a sliver feeding means or device 19 of this invention. As usual, the sliver feeding means at each station is disposed immediately in advance of the yarn feeding means.

The novel sliver feeding means of this invention is illustrated in detail in FIGS. 2-6 inclusive. Referring particularly to FIG. 2, there is illustrated a sliver feeding device 19, a needle 20, needle cylinder 22 and ring gear 24. The latter rotates with the needle cylinder and meshes with the usual pinion 26, to impart driving power to the sliver feeding device. The sliver feeding device or means includes the usual wire-covered doffer 28 and main cylinder 30, for transferring a roving of sliver 32 from a source (not shown) to the needles 20 of the knitting machine. The doffer and main cylinder are caused to rotate, respectively, in the directions indicated by the arrows of FIG. 2, by the driven pinion 26 through conventional drive mechanism not fully shown, but which includes gearing 50 (FIG. 1) and the vertical and transverse shafts, and their associated gearing, comprising part of the shafting and gearing indicated collectively by the reference numeral 58 (FIG. 2). Gearing 50 is conventional gearing of the type usually employed in this art for driving the main cylinder and doffer from pinion 26 by well known intermediate drive means which includes the vertical and transverse